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Reconstruction of the (0001) Surface of Graphite near Step Edges
EDWARD KINTZEL, Spallation Neutron Source, Oak Ridge National Laboratory, HONG LUO, Department of Physics, SUNY at Buffalo — We report on the surface reconstruction of the (0001) surface of graphite near step edges using scanning tunneling microscopy (STM). The surface reconstruction of the (0001) surface has the well studied triangular symmetry. Further reconstruction near point defects have been studied both experimentally and theoretically. Our studies of the graphite surface near step edges shows two types of further reconstructions of the triangular lattice. The symmetry of the first (Type I) surface reconstruction remains triangular, but rotated 30° from the original surface lattice. The periodicity of the observed pattern is 1.73 times the original surface reconstruction, and is equal to 3a (a is the bond length in graphite). The second (Type II) has hexagonal symmetry with a periodicity 1.73 times the C-C bond length. The relationship between the two structures will be discussed. The effects can be qualitatively expected based on the difference in atomic configuration near and far away from step edges.

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